DESCRIPTION

Under this item the CONTRACTOR shall perform all work associated with installing new grating and fiberglass scuppers at the locations indicated on the contract plans. The work shall consist of the following operations: 1.) Remove and dispose of the existing __ mm open floor grating. 2.) Remove and dispose of the existing angles on which the existing grating rests. 3.) Install new fiberglass scupper system. 4.) Install new galvanized scupper grating.

MATERIALS

1.) Fiberglass scupper material: Resin- The resin used shall be of a commercial grade and shall be evaluated as a laminate by test or determined by previous service to be acceptable for the environment.

2.) Fillers and pigments: The resins used shall not contain fillers except as required for viscosity control. Up to 5% by weight of thixotropic agent which will not interfere with visual inspection may be added to the resin for viscosity control. Resins may contain pigments and dyes by agreement between fabricator and purchaser, recognizing that such additions may interfere with visual inspection of laminate quality. Antimony compounds or other fire retardant agents may be added as required for improved fire resistance.

3.) Reinforcing Material: The reinforcing material shall be a commercial grade of glass fiber having a coupling agent which will provide a suitable bond between the glass reinforcement and the resin.

4.) Surfacing Materials: Unless otherwise agreed upon between fabricator and purchaser, material used as reinforcing on the surface exposed to chemical attack shall be a commercial grade chemical resistant glass having a coupling agent.

Note: The use of other fibrous materials such as acrylic and polyester fibers and asbestos may affect the values obtained for the Barcol hardness of the surface.

5.) Laminate: The laminate shall consist of an inner surface, an interior layer, and an exterior layer or laminate body. The compositions specified for the inner surface and interior layer are intended to achieve optimum chemical resistance.

a.) **Inner Surface**- The inner surface shall be free of cracks and crazing with a smooth finish and with an average of not over 21 pits per square meter, providing pits are less than 3.2 mm in diameter and not over 0.8 mm deep and are covered with sufficient resin to avoid exposure of inner surface fabric. Some waviness is permissible as long as the surface is smooth and free of pits. Between 0.25 and 0.51 millimeters of reinforced resin-rich surface shall be provided. This surface may be reinforced with glass surfacing mat, synthetic fibers, asbestos, or other material as usage requires.

b.) **Interior Layer**- A minimum of 2.54 mm of the laminate next to the inner surface shall be reinforced with not less than 20 percent nor more than 30 percent by weight of noncontinuous glass strands.

c.) **Exterior Layer**- The exterior layer or body of the laminate shall be of chemically resistant construction suitable for the service and providing the additional strength necessary to meet the tensile and flexural requirements. Where separate layers such as mat, cloth, or woven roving are used, all layers shall be lapped a minimum of 25 millimeters. Laps shall be staggered as much as possible. If woven roving or cloth is used, a layer of chopped-strand glass shall be placed as alternate layers. The exterior surface shall be relatively smooth with no exposed fibers or sharp projections. Hand work finish is acceptable, but enough resin shall be present to prevent fiber show.

When the outer surface is subject to a corrosive environment, the exterior surface shall consist of a chopped-strand glass over which shall be applied a resin-rich coating previously described. Other methods of surface protection may be used as agreed upon between buyer and seller.

d.) **Cut Edges**- All cut edges shall be coated with resin so that no glass fibers are exposed and all voids filled. Structural elements having edges exposed to chemical environment shall be made with chopped-strand glass reinforcement only.

e.) **Joints**- Finished joints shall be built up in successive layers and be as strong as the pieces being joined and as crevice free as is commercially practicable. The width of the first layer shall be 51 millimeters minimum. Successive layers shall increase uniformly to provide the specified minimum total width of overlay which shall be centered on the joint. Crevices between jointed pieces shall be filled with resin or thixotropic resin paste, leaving a smooth inner surface. The interior of joints may also be sealed by covering with not less than 2.54 millimeters of reinforced resin-rich surface as previously described in paragraphs "a" & "b".

f) **Wall Thickness**- The minimum wall thickness shall be 8 mm. The laminate shall have a Barcol hardness of at least 90% of the resin manufacturer's minimum specified hardness for the cured resin when tested.

g.) **Appearance**- The finished laminate shall be as free as commercially practicable from visual defects such as foreign inclusions, dry spots, air bubbles, pinholes, pimples, and delamination.

REINFORCED-POLYESTER PIPE

The standard pipe size shall be the inside diameter in millimeters. The tolerance including

out-of-roundness shall be 1.6 mm. This measurement shall be made at the point of manufacture with the pipe in an unstrained vertical position.

Length- The length of each fabricated piece of pipe shall not vary more than 3.2 mm from the ordered length unless arrangements are made to allow for trim in the field.

a.) **Wall Thickness**- The minimum wall thickness of the pipe shall be 4.8 mm.

b.) **Squareness of Ends** -All unflanged pipe shall be cut square with the axis of the pipe within 3.2 mm.

c.) **Fittings**- All fittings such as elbows shall be equal or superior in strength to the adjacent pipe and shall have the same diameter as the adjacent pipe.

d.) **Elbows**- Standard elbows shall have a centerline radius of one and one-half times the diameter. Elbows shall be molded of one piece construction. Mitered elbows 45 deg. or less will be one-miter, two section. Elbows above 45 deg. through 90 deg. shall have a minimum of two miters.

SUPPORT ANCHOR

Concrete attachment clamp shall be A36 steel, and shall be the correct size for attachment to an 200mm fiberglass pipe.

Attachment rod shall be 19mm, conforming to ASTM A588.

Steel Grating:

Galvanized steel grating shall be Ohio Grating or approved equal with bearing bars 125mm deep x 6mm thick, spaced on 60mm centers. Cross bars shall be 25mm deep x 6mm thick, spaced on 100mm centers. Grating panels shall be anchored according to the details on the plans. Anchoring devices shall be standard anchor block, as indicated on the plans. Finish to be mill finish. Size of the grating sections shall be as shown on the plans.

METHOD OF MEASUREMENT

The work under this item will be measured for payment on a lump sum basis.

BASIS OF PAYMENT

The lump sum bid shall include the cost of all material, equipment, and labor necessary to complete the work in a manner approved by the ENGINEER.

Payment will be made under:

Item No.	**Item**	**Pay Unit**

566.03M	Install New Grating and Fiberglass Scuppers	LS